a review of Collected works. Volume 7: 2002 2013 by Atiyah, Michael

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Oxford: Oxford University Press (ISBN 978-0-19-968926-2/hbk; 978-0-19-968927-9/set). xxxiv, 442 p. (2014).

This volume contains 33 papers written from 2002 through 2013.

Three papers [Zbl 0778.53051; Zbl 1238.83047; "Geometric models of matter", Proc. R. Soc. Lond., Ser. A, Math. Phys. Eng. Sci. 468, No. 2141, 1252–1279 (2012; doi:10.2307/41511062)] provide "novel and unorthodox ideas" on the frontier between mathematics and physics, expecting the younger generation of mathematical physicists working in string theory and its ramifications to make technical advances to current problems. Two papers [Zbl 1151.55301; Zbl 1273.53041] are of strictly mathematical character with a physical background and motivation.

The papers [Zbl 1049.57500; Zbl 1136.01012; "Riemann's influence in geometry, analysis and number theory", Conf. FME 15 (2008); "Duality in mathematics and physics", Conf. FME 15 (2008); "Eighty years on", in: A community of scholars: impressions of the Institute for Advanced Study. Princeton, NJ: Princeton University Press (2011); "Advice to a young mathematician", in: T. Gowers (ed.) et al., The Princeton companion to mathematics. Princeton, NJ: Princeton University Press. 1000–1010 (2006); cf. Zbl 1242.00016] are survey articles dealing with geometry and physics in some form or other.

The papers [Zbl 1121.00307; "The art of mathematics", Notices Am. Math. Soc. 57, No. 1, 8 (2010); "Mind, matter and mathematics", Berlin-Brandenburg Academy of Sciences, Berichte und Abhandlungen 14, 151–161 (2008); "Individual genius or cultural environment?", La mathématique: les lieux et les temps. Vol. 1. 1–10 (2009); "The Athens dialogues: science and ethics. The spirit of mathematics", unpublished (2011); "The elements", Festival Milanesiana lecture (July 2008)] are of considerably philosophical nature, the first two being concerned with the aesthetic nature of mathematics, the third dealing with the deepest question concerning the nature of mathematics, the fourth discussing the famous problem with due regard to his long career in academics, the fifth representing "a rounded philosophical view of mathematics", and the sixth giving a lighter treatment.

Two book reviews are included in the volume, namely ["Bourbaki, a secret society of mathematicians and The artist and the mathematician", Notices Am. Math. Soc. 54, No. 9, 1150–1152 (2007)] on [Zbl 1099.01022; Zbl 1159.01005] and ["Thoughts of a mathematician", Brain 131, 1156–1160 (2008)] on [Zbl 1141.01002].

["Raoul Harry Bott: 24 September 1923 – 20 December 2005", Biogr. Mem. Fell. R. Soc. 53, 63–76 (2007)] is a tribute to Bott, giving his bibliographical memoir. ["Autobiography", in: H. Holden (ed.) and R. Piene (ed.), The Abel Prize 2003–2007. The first five years. Berlin: Springer (2010; Zbl 1247.01025)] (cf. [Zbl 1285.00024]) is his autobiography as an Abel Prize laureate. [Zbl 1206.01039] is Atiyah's assessment of Hitchin's mathematical achievements.

["The encoding of temporally irregular and regular visual patterns in the human brain", PLoS One 3 (2008)] is published in a neuro-physiology journal, occupying a unique position among many mathematical or physical papers of Atiyah.

When Atiyah retired as Master of Trinity College, he moved north to Edinburgh (the home city of his wife) to spend his remaining life there. Since then he has been an honorary professor at the University of Edinburgh. Atiyah was very enthusiastic about the Scottish Enlightenment, let alone Scottish independence. As is well known, the 18th century is the century of Enlightenment in Europe, and Scotland was no exception. Even such despots as Friedrich II of the House of Hohenzollern, Maria Theresia and Joseph II of the House of Habsburg, Yekaterina II of the House of Romanov and, once more, Mahmud II of the Ottoman Empire are known as Enlightened despots. Two papers about the Scottish Enlightenment are enclosed in the volume, namely ["Benjamin Franklin and the Edinburgh Enlightenment", Proc. Am. Philos. Soc. 150, 591–606 (2006); "Lessons from the Scottish Enlightenment", Biennial Lecture of the Faculty of Actuaries, British Actuarial Journal 16, 1–14 (2011)]. The first was a lecture given at the 300th anniversary of the birth of Benjamin Franklin at the American Philosophical Society in Philadelphia. It

is well known that the independence of the United States of America from the Great Britain was inspired much by the Enlightenment in Europe. The second was a lecture given at a meeting of the Faculty as an honorary fellow of the Faculty of Actuaries.

Two papers ["Science and the military", in: R. Spier (ed.), Science and technology ethics. London: Routledge (2002); "Science, society and side effects", in: Science & publishing affairs. British Science Association. 22–23 (2002)] give broad ethical issues related to science as President of the Pugwash Conference on Science and World Affairs. ["Jo Rotblat: man with a cause", in: R. Braun (ed.) et al., Joseph Rotblat: visionary for peace. Weinheim: Wiley-VCH. 99–101 (2007)] discusses the founder of Pugwash and Nobel Peace Prize laureate Joseph Rotblat.

All in all, it is a great pleasure to see all these papers in one volume.

For the previous volumes of Atiyah's collected works see [Zbl 0935.01034; Zbl 0724.55001; Zbl 0724.53001; Zbl 0691.53003; Zbl 1099.01024].

Reviewer: Hirokazu Nishimura (Tsukuba)

MSC:

01A75 Collected or selected works; reprintings or translations of classics
00A30 Philosophy of mathematics
14-03 History of algebraic geometry
53-03 History of differential geometry
55-03 History of algebraic topology
81-03 History of quantum theory